British Waterways London

PRESCOTT CHANNEL WATER CONTROL STRUCTURE
PROJECT EXPLANATORY STATEMENT

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1.0 Introduction

1.1 Project overview

In March 2006 British Waterways (BW), the Environment Agency (EA) and English Nature (EN) – the statutory agencies of the Department for Environment, Food & Rural Affairs (Defra) – put forward a joint recommendation for how the waterways of the Lower Lea Valley could best contribute to the delivery of an inspirational, safe and inclusive Olympic & Paralympic Games and leave a sustainable legacy for London and the UK. A key objective was to provide the Olympic Delivery Authority (ODA), London Organising Committee for the Olympic Games (LOCOG) and wider Olympic stakeholder group with a practical and consensual approach for utilising the waterways before, during and, crucially, after 2012.

Fundamentally, the Agencies recognised that the waterway network of the Lower Lea Valley extends beyond the boundaries of the Olympic planning zone and, as part of the East London Green Grid, offers significant opportunities for sustainable environmental improvements across the whole network. Where proposals lie outside the Olympic Park, the Agencies strongly recommend that the local planning authorities and other strategic bodies incorporate them into their local plans.

1.2 Defra-family recommendation

The Defra agencies recommended maximising the use of the waterways for leisure and commercial freight navigation, biodiversity, public access, amenity and flood conveyance. In practical terms this translated as:

- enhancement of tidal habitats, mudflats and reedbeds on Bow Creek and Abbey Creek;
- restoration of water meadows and improvement of playing fields north of the Olympic Park.
- the construction of a water control structure at Prescott Channel, combining sluice, lock, public access and fish pass;
- improvement of the existing navigation and Bow Locks to accommodate increased commercial and leisure traffic;
- modification works to river walls to enhance their ecological value, including the naturalisation of the upper Old River Lea between Carpenters Road Lock and the A12 to create an enhanced wetland area;

This recommendation was based on a range of studies carried out by and on behalf of the agencies and followed discussions with a broad spectrum of expert opinion. The position was reached after a review of a series of waterway restoration options against an agreed set of sustainability principles, underpinned by the aspirations of *Towards a One Planet Olympics*. The proposals enjoy widespread support and provide a realistic blueprint for the early delivery of Government and Mayoral pledges for a ‘green’ Games and Legacy.

The Defra-family recommendation offers an opportunity to demonstrate how best practice waterway restoration and habitat creation can be incorporated into the Olympic and Legacy construction programme, minimising project risks by the use of tried and tested technologies and methodology.

1.3 Benefits

Early assessments indicated that the recommended plan is achievable within current budgets and will unlock considerably greater economic, environmental and social value for local people and taxpayers. Benefits could include:

- reduction in risk for Olympic Construction phase and removal of c.500,000 lorry journeys from local roads
- c.8,000 tonnes CO2 saved
- creation of new tidal, riverine and wetland habitats
- opportunity to create new moorings and introduce leisure boating
- land values increased by c.£30million
- enhanced security before and during the Games
- opportunity to introduce hydro-electricity and new heritage interpretation features at Three Mills

1.4 Olympic waterway workshops

Since March 2006, the agencies have been engaged in a series of workshops with the ODA, London Thames Gateway Development Corporation (LTGDC), Defra and a range of other stakeholders to identify how the Defra-family aspirations might best be delivered. As part of this process it was agreed that British Waterways would take the lead on the development of the water control structure and the following explanatory note relates primarily to this element of the water restoration recommendation.

1.0 The Bow Back Rivers

The waterways of the Lower Lea Valley have undergone huge changes through man's intervention. Works to the natural river delta commenced around one thousand years ago, making the system one of the oldest artificial navigations in the country. The system continually evolved, with well-documented evidence of extensive industrial activity associated with the area, much of which was serviced by water. Up to the middle of the last century canals began to fall into disrepair nationally. The last significant alteration to the waterways of the Lower Lea Valley was the flood relief works of the 1930s which included the construction of City Mill Lock, Carpenters Road Lock and Prescott Channel.

The Lower Lea ceased to function as a natural river delta hundreds of years ago, but the resulting man-made environment is unquestionably of importance to this part of London's natural and built heritage.

The catalyst of the Olympics provides the potential to create a new era for this waterway which restores its original navigation function whilst meeting present day ecological aspirations.

Figure 1 : Aerial view of Prescott Channel and Three Mills Wall River

A key aspect of this new era for the waterways of the Lower Lea is the joint Defra agencies proposal to maximise the use of the rivers for transport, people and wildlife. The proposal includes a plan to reintroduce a water control structure in Prescott Channel to control water levels and facilitate navigation north of Three Mills.

This Project Statement focuses on the Prescott Channel structure, explaining British Waterways' findings and position on the development of the scheme and its contribution to delivering the Defra agencies' and other key stakeholders' objectives in this area.

This Statement addresses a number of areas relating to the major works, including:

- An overview of the scheme;
- Environmental considerations;
- The results of the related comprehensive Flood Risk Assessment and;
- The position regarding the use of British Waterways' Permitted Development powers to deliver the works.

2.0 Technical

2.1 Technical Assessment

The proposal to control water levels north of Prescott Channel requires the construction of two structures, one within Prescott Channel itself with a second to the rear of the House Mill at the southern end of Three Mills Wall River. The structure within Prescott Channel incorporates a navigable lock in addition to the water control mechanism.

The proposed lock will have access from the tidal approach for about 4 hours around each high tide, reducing to around 1 hour on neap low tides. At present we have assumed the need to pass an average of at least 1,000 tonnes of material through the lock in a 24-hour period, based on ODA forecasts.

The key functional parameters of the proposed structures are set out below:

- prevent all tidal influence on the Prescott Pound, up to a level of 4.8m AOD;
- retain constant upstream water level of approximately 2.3m AOD;
- no restriction to the conveyance of flood water;
- allow a navigable passage from Bow Creek (downstream) to the Prescott Channel (upstream) for water levels in Bow Creek from 1.5m AOD to 4.8m AOD;
- allow through flow of river water and accommodate the passage of fish (and other fauna) through the structure;
- require minimal maintenance dredging;
- accommodate 2 nbr barges each 7m beam x 30m length.

Lock Layout

The lock will lay parallel with the bypass channel incorporating the control weir lying alongside the lock. This arrangement will require widening on one or both sides of the existing channel to permit construction of the lock while retaining the same channel discharge capacity.

Lock Sizing

The lock will be sized to permit two 30m barges to be locked simultaneously. Minimum vessel clearances laterally, longitudinally and vertically will be used to: reduce construction costs; limit water loss in operation; and minimise lock filling/emptying times. Preliminary estimates suggest that the lock will be approximately 62m long x 8m wide

Lock Duties

The function of the lock is, as with most locks, to permit the passage of vessels between stretches of water at different levels. What differentiates

the proposed Prescott Channel Lock from most other locks is that while the upstream level will remain constant the downstream level will range between being below the impounded level to being above the impounded level. This requirement precludes the use of the most usual arrangement of two sets of mitre gates as mitre gates are unsuitable for reverse head loading. Additionally, the lock, with all gates fully open, can be used as emergency flood relief channels if for any reason the bypass channel is unable to pass a flood, however this is not recommended as an integral element of the normal operating strategy.

Lock Gates

As previously noted the requirement for the lock gates, both head and tail, to be able to operate with a differential water head on either side of the gate precludes the use of conventional mitre gates. It would be possible, as on some locks, to use double mitre gates; that is two pairs of gates at each end of the lock, one "pointing" upstream and the other "pointing" downstream. This, however, is a cumbersome and expensive option and is disregarded on this basis.

Other types of gate able to operate with we have assessed head are vertical axis sector gates and vertical lift or "guillotine" gates. Sector gates as the preferred option as they reduce the overall length of the lock and do not require overhead apparatus.

The top level of each gate will be at a nominal freeboard above the MHWS level giving a top of gate level of around +4.8m AOD. The bottom of the locks and the gates will be at around –0.8m AOD. The lock gates will be approximately 5.6m high.

Consideration will be given to the fitting of ship fenders on the lock gate faces to provide protection from low impact collisions from barges or tugs. The gates, and all other steelwork, will be protected by a surface protection system giving a minimum of 20 years to first maintenance.

Lock Structure

The lock side walls and the lock floor will be constructed in reinforced concrete and steel sheet piles. Sector gates at both ends of the lock will facilitate emptying and filling the chamber.

Stop-log slots will be incorporated at each of the locks to aid lock isolation for gate and for lock maintenance purposes.

Weir Control Gates

The width of the weir channel is provisionally set at 27m. Three 8m wide gates are proposed, each separated by a divide pier.

The precise nature of the water control gates is yet to be completely finalised, however, Fish Belly Gates are the preferred option.

The precise method of gate construction and the system of gate hoisting will be agreed with the Environment Agency.

Gate Control

A system of traffic control lights extending both upstream and downstream will permit the operator to regulate traffic through the lock.

Operation of the control sections of the weir will be automatic, a preset impounded level will be monitored by level sensors and the gate adjusted accordingly. Similarly, level sensors downstream of the lock will monitor the tide level and raise the weir gates to the tidal defence position to protect against an incoming tide.

Programmable logic controllers will be used to control, monitor and protect weir and lock operations.

Control stations will be installed adjacent to each lock gate for local operation and maintenance purposes.

Power Supply and Backup

All gate operations will be powered by electro-mechanical drives with a 3 phase grid supply as the primary source. A standby diesel generator with auto-changeover will provide backup in the event of a power failure.

Barge Mooring Areas

Due to the restricted tidal navigation windows, we have identified the need for barge mooring areas within the channels. Barges can be moored awaiting tidal access or awaiting the next lockage at peak times. We have assumed that there will be berths either side of the locks. The tidal berths would be downstream of the locks to allow sufficient room for vessels that have just exited the locks to pass. The mooring upstream of the locks has been sited to allow barges to exit the lock without disturbing the moored vessels.

We have assumed that the mooring areas will comprise single large diameter steel piles. The exact configuration will need further assessment at barge selection stage and in consultation with barge operators.

The water control structure is a major undertaking involving a complex combination of civil engineering and new hydraulic gates. This study has taken the project forward to the stage where an outline programme of works has been prepared, extending from scheme development and survey work through to procurement of a contractor and construction of the structure.

The lock, water control structure and existing rights of way will be accommodated within British Waterways' land ownership and this thus assumes:

- a control structure 27 metres wide (three 8m gates plus two intermediate 1.5m piers);
- a lock chamber 8 metres wide;
- an island between the lock and the channel through the control structure;
- The current permissive right of way over the mouth of the Prescott Channel redirected over the lock and water control structure.

3.0 Environmental Information

3.1 Introduction

The purpose of this section is to provide a review of environmental considerations of the developing project for the Water Control Structure on Prescott Channel and associated works. The scope of this evaluation covers ecology, heritage and landscape character. The report takes account of the temporary construction phase and the operational phase once the structures are in place.

The report is based on both primary and secondary data provided via the project's stakeholders.

Given the scale of development proposed within the study area a great deal of useful and comprehensive data has been gathered on behalf of the Olympic Development Agency by their consultants. Equally informative data has been provided by the Environment Agency.

Primary data has been collected via survey work carried out by British Waterways' own professional resources.

A reptile and amphibian survey has been undertaken.

Water Quality is being considered separately from this report by British Waterways and the Environment Agency via separate but complementary work streams.

3.2 Study Area

The Bow Back River System, situated within the Lower Lea Valley, is a network of natural and man-made watercourses. The network has historically undergone extensive modification in the form of canalisation and associated water control as well as being further expanded with the building of a flood conveyance channel.

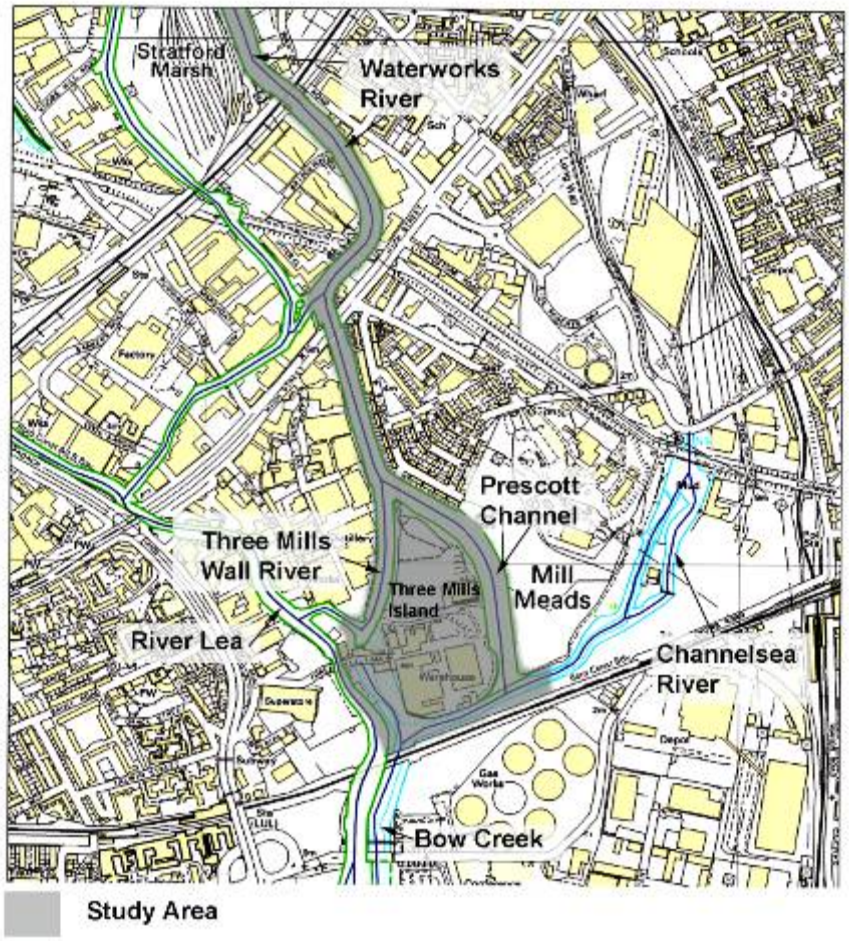


Figure 3 : Study Area

The areas of influence have been broken down into the following watercourses and landscape character areas:

- Prescott Channel
- Three Mills Wall River
- Waterworks River

Study Area

The Study Area lies within the Lower Lea Valley Corridor which stretches from the rural edge of London defined by the M25 south to the River Thames. While the Lea Valley north of Stratford possesses environmental assets of great value to London, containing areas of good landscape quality, the stretch of valley within which the Study Area is located is more densely developed with a complex mix of residential communities, town

centres and extensive areas of industrial development. The history of heavy industry and its subsequent decline has left the area with widespread areas of contaminated and barren sites, neglected buildings and structures which has resulted in a generally low quality landscape through the majority of the Study Area. Linked with this generally poor landscape character, the Study Area is generally of low visual quality, particularly along the river boundaries. Within the Study Area, however, areas such as Three Mills and Three Mills Green form focal points of good landscape and visual quality. The entire study area is a designated an Archaeological Priority Area within the London Borough of Newham UDP due to its archaeological value.

Three Mills and Three Mills Island

Three Mills is designated as part of Three Mills Conservation Area under the Planning (Listed Buildings and Conservation Areas) Act 1990. The site has a distinctive, high-quality character due to the presence of the mills and other historic waterside buildings set at the conjunction of the River Lee Navigation, Three Mills Wall River, Bow Creek and Channelsea River. Various historic buildings have been restored for a range of uses, including education, tourism and creative industries, combining vibrant modern uses within an area of outstanding built heritage.

Three Mills Green is a large public recreational area owned by Lee Valley Regional Park Authority and forms the northern end of Three Mills Island. It has been improved in recent years and now forms a valuable green open space and landscape resource in the Study Area.

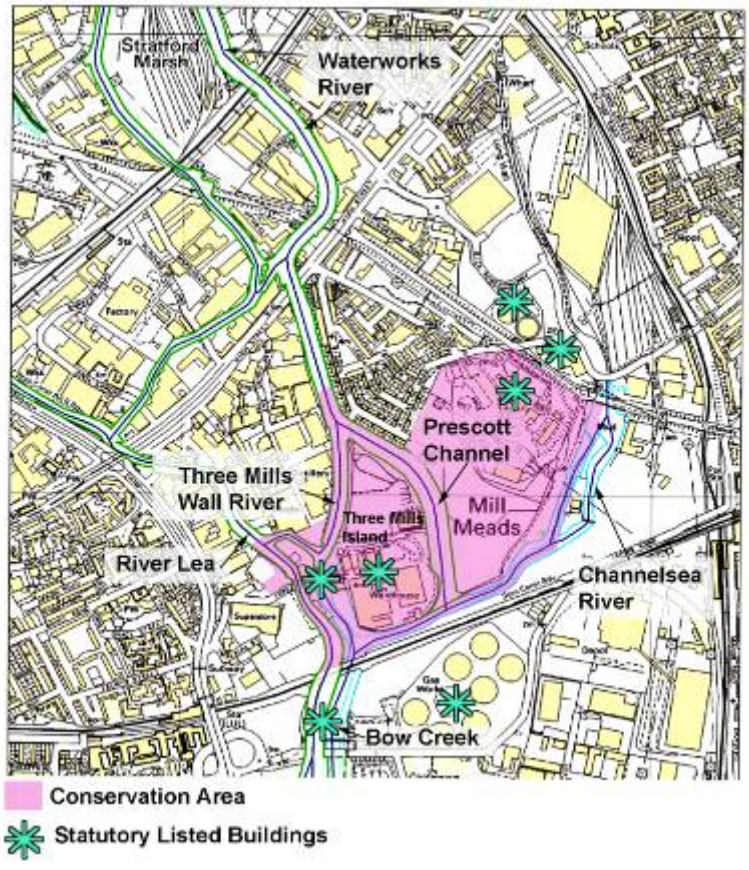


Figure 4 : Conservation Area

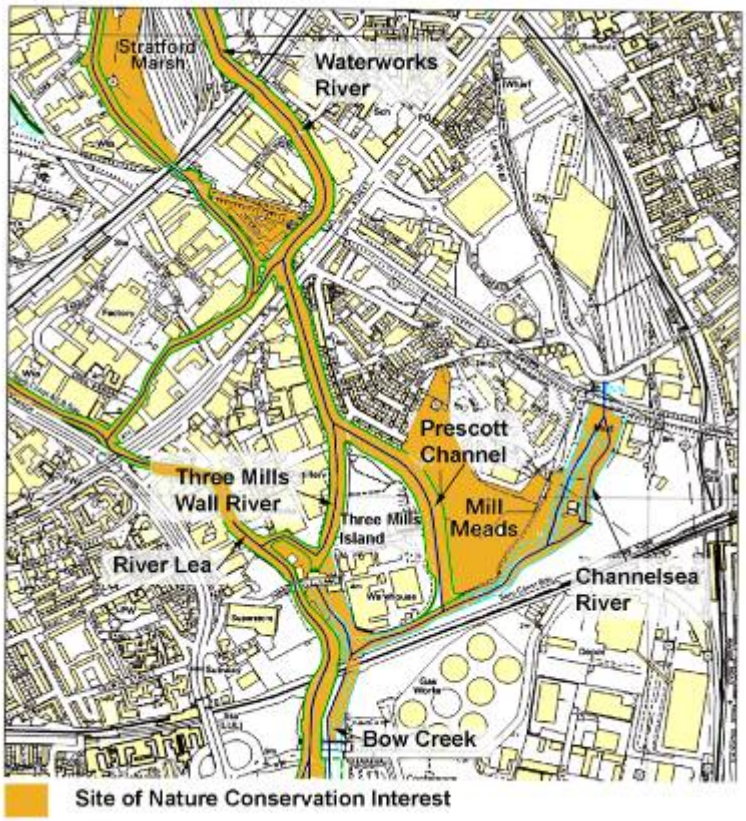


Figure 5 : Site of Nature Conservation Interest

There are no sites of international or national ecological importance within the study area for the Bow Back Rivers. There are, however, a number of areas of importance at the Regional level.

Sites of Metropolitan Importance

Sites of Metropolitan Importance for Nature Conservation are those which:

- contain the best examples of London's habitats;
- contain rare species/rare assemblages of species; or
- are of particular significance in areas that are otherwise built-up.

In the regional context, these sites have the highest priority for protection, not only to support London's wildlife but also to provide opportunities for people to have contact with the natural environment.

Within the Bow Back Rivers study area, Bow Creek from Bow Locks to Three Mills, Channelsea River, the River Lee Navigation and Old River Lea form part of River Thames and Tidal Creeks site of Metropolitan Importance for Nature Conservation. The section within the London Borough of Newham has been designated because it is of considerable value for birds and invertebrates, in particular, a nationally rare snail (*Pseudamnicola confusa*) and populations of *Tubifex* worms (London Ecology Unit, 1991).

Sites of Borough Importance

Within the Bow Back Rivers study area, Prescott Channel, Three Mills River, Bow Back River, Waterworks River, City Mill River and Pudding Mill River are all designated Sites of Borough Importance Grade 1. These waterways all contain important wildlife habitats in a local context, but in comparison to the metropolitan site within the same borough the channels have less value as they support patches of exposed transitory sediment rather than intertidal mud banks and subsequently host fewer birds and a less diverse assemblage of invertebrates. Wetland vegetation is however present and species composition includes some less common plants including Hemlock water dropwort (*Oenanthe crocata*).

3.3 Scope of the Proposed Works

The proposed works will, via the construction of water control structures within Prescott Channel and adjacent to Three Mills, create a controlled water level at 2.3m AOD extending northwards through Prescott Channel and along Waterworks River as far north as the A12.

The water control structures will each protect against the inflow of tidal waters below 4.8m AOD whilst at the same time managing the release of fluvial water flows through the structure to maintain the required upstream water level.

The proposed control structure within Prescott Channel will comprise water control gates to control water levels as well as a lock structure to facilitate the movement of freight.

The proposed control structure to the rear of Three Mills will comprise three water control gates only.
Proposed control structure to the rear of Three Mills to comprise of 2 OR 3 gates – further modelling will confirm. (CP)

3.4 Prescott Channel

The Prescott Channel is subject to tidal influence. It is a trapezoidal-shaped conduit formed from concrete slabs. This is a uniform shape with a smooth finish on the walls which have no cracks or crevices and, therefore, no mural vegetation. The bed of the conduit has a little exposed sediment mostly collected around fly tipped waste such as tyres but no permanent inter tidal mudflats have been formed and no emergent vegetation is present. The upper banksides have remained mostly undisturbed and unmanaged which has allowed a variety of flora to colonise, some of which overhangs the wall.

Designation: Site of Borough Importance for Nature Conservation

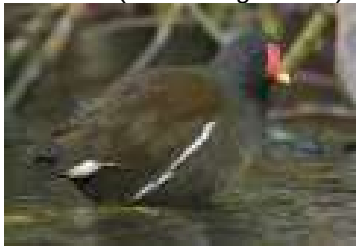
Figure 6 : Prescott Channel looking south at high water

3.5 Ecology and Nature Conservation

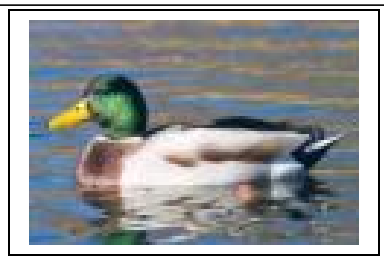
3.5.1 Birds

The avifauna of the Prescott Channel is very poor; there are no opportunities for water birds to nest but mallard (*Anas platyrhynchos*) and moorhen (*Gallinula gallinula*) have been seen foraging. Kingfisher (*Alcedo atthis*) a notable species, is known to use the waterway corridor but again there are currently no opportunities for nesting sites (Gedge, 2004). Grey wagtails (*Motacilla cinerea*), which are restricted to river channels and so relatively scarce in London, occur upstream and are likely to forage in this area. No crevices are apparent in the channel wall so it is unlikely that they nest in the area. A diverse range of terrestrial species have been recorded and this reflects the range and proximity of local habitat resources which, apart from a narrow strip adjacent to the waterway, will remain undisturbed through the course of the construction works. This includes Goldfinch (*Carduelis carduelis*), Song Thrush (*Turdus philomelos*), Whitethroat (*Sylvia communis*), Blackcap (*Sylvia atricapilla*) and, notably, the Linnet (*Carduelis cannabina*). Small birds such as the Linnet can be associated with low-growing shrubs and scrub such as the brambles immediately adjacent to the channel and in the allotment area. Further undisturbed land extends beyond the allotments alongside Channelsea River.

Moorhen (*Gallinula gallinula*)



Mallard (*Anas platyrhynchos*)



Song Thrush (*Turdus philomelos*)

Kingfisher (*Alcedo atthis)*

Grey wagtail (*Motacilla cinerea*)

Linnet (*Carduelis cannabina)*

The construction of a lock and associated weir within the Prescott Channel will have a limited effect on the birds in the locality. Water birds will continue to use the upper reaches of the waterway, although Kingfishers are less likely to pass while there is human activity on site progressing the construction work. The construction procedure will require the clearance of 350 linear metres of adjacent wasteland and allotment. This will in the short term reduce the amount of habitat available to nesting and foraging birds; however, a substantial amount of scrub will remain undisturbed in the immediate locality which can support these activities. The site set up, access and egress will create a short term disturbance to the managed grassland. This is an extensive area which, although no records exist, may support some ground feeding birds.

3.5.2 Mammals

No water voles, otters or badgers have been identified within the locality. The habitat available is very poor and, in its current state, unlikely to be able to support these mammals. No records for bats have been found, however, it is likely that they feed over the channel and its adjoining lands. No roosting areas have been identified along the Prescott Channel. Overhanging and nearby trees are limited and the single bridge does not offer the right conditions.

The lack of protected mammals in the area means that the work and associated water control will not have any negative effects.

3.5.3 Reptiles

Grass snake (*Natrix natrix*) was last observed on the allotment site two years ago. There is still suitable habitat for a range of reptiles including slow worm (*Anguis fragilis*) and common lizard (*Lacerta vivipara*). Survey work has been carried out to determine the presence of reptiles and guide future actions such as translocation and habitat enhancement. No reptiles were recorded on the site which will be affected.

3.5.4 Fish

Freshwater Fish

The only formal fish population survey that has been undertaken on the tidal Lower River Lea was that undertaken by the National Rivers Authority (Tyner 1992). This non-quantitative survey was carried out in the summer of 1991. In this survey a total of eight coarse fish species were recorded, namely bream (*Abramis brama*), roach (*Rutilus rutilus*), dace (*Leuciscus leuciscus*), perch (*Perca fluviatilis*), bleak (*Alburnus alburnus*), pike (*Esox lucius*), stickleback (*Gasterosteus aculeatus*) and tench (*Tinca tinca*).

Bream (*Abramis brama*),

Roach (*Rutilus rutilus)*

Dace (*Leuciscus leuciscus)*

Perch (*Perca fluviatilis*),

Bleak (*Alburnus alburnus)*

Pike (*Esox lucius*)

Stickleback (Gasterosteus aculeatus)

Tench (*Tinca tinca*).

As far as it is currently possible to tell the fish population, certainly from Stratford Marshes upstream, appears to be dominated by coarse fish species.

Migratory Fish

Five species considered 'marine' or 'estuarine' were recorded in the 1991 survey, namely eels (*Anguilla Anguilla*), flounder (*Platichthys flesus*), mullet, (*Mugil labeo*), smelt (*Osmerus eperlanus*) and the sand smelt (*Atherina presbyter*). Eels were found to be present throughout the Lower Lea in the survey. Smelt, mullet and sand smelt were only found in the reaches downstream of the proposed control structures. A solitary flounder (*Platichthys flesus*) was to the north of the proposed control structure.

Petromyzon marinus

Lampetra fluviatilis

Flounder are the most likely marine species to be present a long distance upstream as they can live most of their life-cycle entirely in freshwater. However, the flounder does need to return to salt water to breed. It is possible that young flounder (2 cm and longer) are present throughout the tidal zone.

Flounder (*Platichthys flesus*)

In the 1991 survey there was no evidence of thick lipped grey mullet (*Chelon labrosus*) upstream of the confluence of the Channelsea River and Bow Creek

Thick lipped grey mullet (*Chelon labrosus*).

The smelt is another inshore migratory fish that spawns in freshwater during the spring. Smelt were not recorded in the 1991 survey as far upstream of the Bow Creek/Channelsea River.

The sand smelt (*Atherina presbyter*) was recorded at the downstream end of Bow Creek close to the confluence with the Thames.

Sand Smelt (*Atherina presbyter*)

There is no evidence, either from the survey or anecdotally, of any significant attempt by migratory salmonids such as Atlantic salmon (*Salmo salar*) or sea trout (*Salmo trutta*) to enter the Lea catchment.

Given the above it is important that the structure includes adequate mechanisms to allow passage of migrating eels and migrating fish fry both into and out of freshwater at the requisite stages of the life cycle. Account also needs to be taken of the possibility of the future presence of two migratory species of the lamprey family, *Petromyzon marinus* and *Lampetra fluviatilis,* that are known to be present in the Thames estuary and the design of the structures needs to be such that it remains possible for these species to access freshwater.

3.5.5 Crayfish

No native white clawed crayfish (*Austropotamobius pallipes*) are present. Non native crayfish species have been recorded in the area including the American signal crayfish (*Pacifastacus leniusculus*), as well as Chinese mitten crabs (*Eriocheir sinensis*), which use the rivers as a migratory route.

The construction of the lock and weir and subsequent controlled water level will not affect the movement and distribution of the Chinese mitten crab. The stabilised freshwater system may increase the population of American signal crayfish however the hard waterway banks will limit the underwater habitats they may exploit.

3.5.6 Mudflat Invertebrates

There are no consolidated inter tidal mudflats in the Prescott Channel and, as a result, the macrofauna present in the more mobile exposed sediments are limited in richness and densities (Physalia, 2003). The six species that have been identified are *Limnodrilus hoffmeisteri, Limnodrilus* spp. Immature, *Limnodrilus udekemianus*, *Tubifex tubifex*, Enchytraeid sp and *Asellus aquaticus*.

Limnodrilus hoffmeisteri *Tubifex tubifex*,

Enchytraeid spp.

Asellus aquaticus.

The construction of the lock and control structures and subsequent managed water levels will reduce the mobile exposed sediments at low water.

3.5.7 Aquatic Plants

There are currently no aquatic or emergent plants.

3.5.8 Terrestrial Habitat

The top of the channel banks are currently unmanaged and have developed into a scrub habitat of brambles and diverse small flora, the most notable being Hemlock water dropwort (*Oenanthe crocata*).

Hemlock water dropwort (*Oenanthe crocata*)

A section of the unmanaged channel banks will be incorporated into the construction site. Loss of this habitat will be compensated for through the landscaping scheme and improved habitat on the allotment site. The Hemlock water dropwort is common to the Bow Back River system and will not be lost with controlled water levels.

3.5.9 Invasive Plants

Japanese Knotweed is present on the allotment site and may be disturbed as a result of the construction. Appropriate measures will be taken to ensure this plant does not spread as a result of the construction and any contaminated waste material disposed of at a registered site.

3.6 Heritage and Archaeology

A water control structure originally existed in Prescott Channel but was removed about 20 years ago allowing the tidal system to enter the channel.

The current proposal will alter the profile of the existing channel and widen it in the zone around the new structure. The original appearance of the channel with higher water level will be reinstated and the stretch of land directly adjacent to the new structure will be slightly modified to enable the lock system to be installed. The piers, gates and bridge will be level with the towpath. The only up-standing structure will be the control system.

None of the listed structures on Three Mills Island and Abbey Mill will be directly affected by the works. Although slightly modified, the works will enable the channel to recover some of its original purpose and appearance.

The site lies within a designated 'Archaeological Priority Area' and there may be scope for finding remains during excavation, although unlikely bearing in mind the original construction works were undertaken as recently as the 1930's. British Waterways is liaising with English Heritage on these matters.

View from Prescott Channel towards Abbey Creek with the listed Gasholders behind

View from Abbey Creek towards Prescott Channel

Figure 7 : Prescott Channel Views

3.7 Landscape Character

The Prescott Channel cuts through the open green space of Three Mills Island and Mill Meads. The steeply sloping concrete banks limit its visual and ecological appeal. Allotments extend along the eastern banks and there are attractive views over the channel and Mill Meads from the adjacent land on Three Mills Island, albeit in need of some limited vegetation management to obtain enhanced views. Existing trees and flora should be retained where possible beyond the extent of the new control structure on the western bank as part of the Lee Valley Regional Park Authority open space.

Mill Meads provides a valuable green space which needs protection and management and it is important to keep this open character as far as

possible. The open aspect and views across Mill Meads will be obscured during the construction works primarily by temporary 'heras' type fencing. However, once works are complete, landscape management could improve the long views across Mill Meads to the Victorian (Gothic) Abbey Mills Pumping Station. Prescott Channel will naturally alter in visual terms once the control structure is complete as the soft edges to each side of the channel will be replaced by the lock structure. The new structure will, however, bring interest and vitality to Prescott Channel with the majority of the structure at towpath level.

3.8 Three Mills Wall River

3.9 Ecology and Nature Conservation

The Three Mills Wall River connects the Waterworks River to Three Mills and ultimately Bow Creek and is subject to tidal influence. The majority of the channel walls are composed of vertical pre-cast concrete up-rights, topped by a deep concrete slab, all with a faintly textured finish. A band of algal growth at the mean high tide mark and mural vegetation has become established. The uppermost section of the wall has a number of small square holes of varying depths, depending on the decay of the inserted timbers. This feature has provided sand martins with nesting opportunities and for small trees to grow horizontally from the bank. The structure of the wall changes to early Victorian brickwork contemporaneous with the construction of the tidal mill in the lower limits of the river where it becomes much wider. A large extent of the mudflat occurs in the wide river section immediately adjacent to the mill. Man-made mudflats are also apparent at the base of the far side bank upon which boats are permanently moored and an emergent fringe has become established. The land adjacent to the river on the near side is managed public open space consisting of amenity grassland with hard surfaced path to the edge of the river and trees. The land on the far side is unmanaged wasteland which has a number of shrubs overhanging the top of the wall behind which are some industrial units. The mill buildings rise directly from the river at its most southerly limit.

Designation: Site of Borough Importance for Nature Conservation

3.9.1 Birds

The avifauna of the Three Mills Wall River varies depending on location. Birds with a strong connection to water are found in the wide southerly limits of the river and include: grey heron (*Ardea cinerea*); mute swan (*Cygnus olor*); and mallard (*Anas platyrhynchos*). The kingfisher (*Alcedo atthis*) and grey wagtail (*Motacilla cinerea*) are found to occur along the entire length of the site. Although there are currently no opportunities for nesting for kingfisher, there is potential for grey wagtails to breed. The channel has more opportunities for nesting water birds amongst the marginal vegetation. Small terrestrial species are more prolific in the upper reaches of the river and species such as the great tit (*Parus major*), blue tit (*Parus caeruleus*) and long-tailed tit (*Aegithalos caudatus*) have been recorded. It is most likely that they feed within the adjacent amenity land and small area of scrub behind the boats, areas which will remain undisturbed through the works. The most notable species in this area is

the sand martin (*Riparia riparia*) that has been known to nest in the square holes of the concrete wall.

Grey heron (*Ardea cinerea*)

Mute swan (*Cygnus olor)*

Sand Martin (*Riparia riparia)*

Great tit (*Parus major)*

Blue tit (*Parus caeruleus)*

Long-tailed tit (*Aegithalos caudatus)*

The location of the control structure above Three Mills will leave the wide section of the river intact and tidal so not altering the habitat used by water birds. The construction site will mean that some vegetation from the far side of the river will be removed but this will be limited to about 20 metres of scrub and emergent fringe which will have little affect on the birds' available habitat. It will be recommended that the vegetation is removed between November and March, prior to the main nesting season. The controlled water level will be about 1.5 metres below the square timber holes in the walls which means that the sand martins will still be able to use the unique habitat.

3.9.2 Mammals

No water voles, otters or badgers have been identified within the locality. The habitat available is very poor and in its current state unlikely to be able to support these mammals. Future habitat improvements and management may, however, make it possible to reintroduce water voles, and possibly even otters, to this part of London.

No records for bats have been found, however, it is likely that they feed over the channel and its adjoining scrub. No roosting areas have been identified, although there are good opportunities within the mill buildings adjacent to the water and some mature trees on the amenity land.

The lack of protected mammals in the area means that the work and associated water control will not have any negative effects.

3.9.3 Fish

A desktop survey undertaken using existing reports indicate that there are few brackish or marine fish within the Prescott Channel, Three Mills Wall River or Waterworks River with only flounder (*Platchthys flesus*) and eel (*Anguilla Anguilla*) being recorded. The possible expansion in range of migratory fish currently in the River Thames would be facilitated by the design of the weir structure. See Section 4.1.4 for further detail.

3.9.4 Crayfish

As for Prescott Channel

3.9.5 Mudflat Invertebrates

There are areas of consolidated mudflats in Three Mills Wall River especially adjacent to the rear of the Mill House, although the macrofauna present is limited in richness and densities (Physalia, 2003). The five species that have been identified are *Limnodrilus claparedeanus*, *Limnodrilus hoffmeisteri, Limnodrilus* spp. Immature, *Limnodrilus udekemianus* and *Tubifex tubifex*.

The construction of the control structure is within the narrow channel which means that the mudflats in the wide section of the lower river will remain intact. Only the artificial man made mudflat upon which the boats are moored will be lost with subsequent controlled water levels. The emergent plants in this area will remain intact and the freshwater fluvial system will host a slightly different but richer array of invertebrates, including those already found in the area.

3.9.6 Aquatic Plants

There are currently no aquatic plants but an emergent fringe is present with a reasonably diverse array of species. This will remain intact during the construction period and should be able to tolerate the higher water levels as they are situated on an earth bank. However if the plants are overcome by fluvial inundation then it would be necessary to build up the existing earth bank.

3.9.7 Terrestrial Habitats

Some shrubs overhang the wall on the far side, these will not be disturbed by construction or controlled water levels.

3.9.8 Invasive Plants

No terrestrial invasive plants are present on this river channel. No aquatic invasive plants are currently on site. The site should be monitored and subsequent controls put into place in the event that invasive plant species spread into the newly controlled water system. Existing aquatic invasives are already being mechanically controlled and the environmental conditions promoting growth being assessed with a view to eliminating them.

3.10 Heritage and Archaeology

The areas directly adjacent to the House Mill will not be affected by these works. The tides will still occur below the new structures and the visual appearance of this group of buildings at various water levels preserved. In addition to this, those works would enable the mill to function again.

Figure 8 : Prescott Channel looking north towards Three Mills at high tide

It is currently possible to see below the Three Mill Lane bridge towards the moored boats from the car park behind the House Mill and from the Three Mill garden behind the café. The new structure located just behind that bridge will be visible. Planting on either side will soften the edges. In designing this structure, careful consideration of the surroundings will be taken into account.

The area where the new structure will be installed by the Three Mill Lane will require limited excavation into the original canal bed, presenting scope for finding archaeological remains.

The current channel to the A11 Stratford High Street does not bear any resemblance to a 'natural' tidal river and reads at low tide as a scar in this urban landscape given the depth, width and treatment of the channel. Allowing a constant level of water will improve this aspect of the channel especially from the towpath and the bridges as the vertical panelling of the

lower part of the concrete bank should mostly be hidden and the steps alongside the terrace of late 19th century and early 20th century houses will relate better to the water level.

Figure 9 : Looking north on Three Mills Wall River

3.11 Landscape Character

The area north of Three Mills is diverse in character, but is tightly defined by buildings and boundaries. The eastern boundary is open and attractive adjacent to Three Mills Green and more tightly by housing to the north of the junction with Prescott Channel. Garden vegetation along this eastern section softens the boundary. The eastern towpath adjacent to Three Mills Green forms a section of good quality riverside landscape, with an avenue of Robinia trees inter-planted with young specimen trees. There are attractive views south from Three Mills Wall River of the rear of House Mill and Canary Wharf beyond.

The structure planned for Three Mills Wall River will not rise above the existing concrete channel walls and, therefore, will have fairly limited effect on the landscape character of the area particularly set against the steel structure of the road bridge behind the Three Mills complex of Listed Buildings

Figure 10 : Looking south on Three Mills Wall River

Figure 11 : Looking south towards Three Mills on Three Mills Wall River

Views looking south from this section will have a view of both structures on the two channels in the distance but severely limited in the case of the Prescott Channel structure because of the bend in the channel to the west at the northern section. During construction Heras fencing will be visible for compound areas and piling works during construction.

3.12 Waterworks River

3.13 Ecology and Nature Conservation

Waterworks River has a lesser tidal influence reducing higher up the channel. It is a highly modified waterway along its entire extent with vertical walls which alter in structure and age. The walls range from smooth steel piles to slightly textured concrete walls, some of which have had timber fenders fixed and these are now in varying stages of decay. As a result a band of algal growth has developed in some locations at the mean high tide mark and patches of mural vegetation are present. The bed of the channel has little exposed sediment mostly collected around fly tipped waste but similarly to the Prescott Channel no valuable inter tidal mudflats have been formed. Emergent vegetation is present along the far side bank in small patches. Vertical timber posts are situated in the centre of the channel either side of a number of bridges whose supports are within the channel. This has formed a series of slightly deeper sections of water and limited mural vegetation has developed on the decaying structures. The upper banksides have a number of parallel commercial and residential developments. None of these appear to extend completely to the waters edge and there is a narrow strip of terrestrial vegetation along the majority of the waterway, including a large amount of buddleia overhanging the vertical wall.

3.13.1 Birds

The avifauna recorded on the Waterworks River is limited. A few water birds have been observed including the grey heron (*Ardea cinerea*), mallard (*Anas platyrhynchos*) and moorhen (*Gallinula gallinule*). The kingfisher (*Alcedo atthis*) and grey wagtail (*Motacilla cinerea*) are present along the entire corridor although there are no known nesting sites and very few

opportunities for nesting kingfisher. It is likely that grey wagtail are breeding. The terrestrial bird records are limited to dunnock (*Prunella modularis*) and chaffinch (*Fringilla coelebs*). It is likely that many more species use the adjacent habitats but the actual waterway can provide little habitat. The most notable species in this area is the sand martin that has been known to nest in the square holes of the concrete wall.

Mallard (Anas platyrhynchos)

Moorhen (*Gallinula gallinule)*

Kingfisher (*Alcedo atthis)*

Dunnock (*Prunella modularis)*

Chaffinch (*Fringilla coelebs)*

Grey heron (*Ardea cinerea)*

Controlling the water levels at this location will have no affect on the bird species that use the river. No vegetation will be removed or lost.

3.13.2 Mammals

No water voles, otters or badgers have been identified within the locality. The habitat available is very poor and, in its current state, unlikely to be able to support these mammals. Future habitat improvements and management may however make it possible to reintroduce water voles, and possibly even otters, to this part of London.

No records for bats have been found, however, it is likely that they feed over the channel and its adjoining scrub. No roosting areas have been identified along the Waterworks River although nearby residential houses offer some opportunities.

The lack of protected mammals in the area means that the work and associated water control will not have any negative effects.

3.13.3 Fish

A desktop survey undertaken using existing reports indicates that there are few brackish or marine fish within the Prescott Channel, Three Mills Wall River or Waterworks River with only flounder (*Platchthys flesus*) and eel (*Anguilla anguilla*) being recorded and the possible expansion in range of migratory fish currently in the River Thames.

3.13.4 Crayfish

As for Prescott Channel

3.13.5 Mudflat Invertebrates

There is no valuable inter tidal mudflat in the Waterworks River, although the macrofauna present was of a greater richness and density than in the areas that experience greater salinity and tidal influence. Many of these species would continue to thrive in a stable fluvial environment such as sphaeriid bivalve and enchytraeid species and it is unlikely that any of them will be lost.

3.13.6 Aquatic Plants

There are currently no aquatic plants. Emergent plants are present at various locations along the river; these include reed species and the notable Hemlock water dropwort. It is not expected that this habitat will be affected by controlling the water levels as they are on earth banks and the current diverse floral banks will be retained along with the mural vegetation as this will be above the maximum height of the water.

3.13.7 Terrestrial Habitats

Cracks and crevices in the concrete and decaying timbers will remain in place to continue to provide a unique habitat in the transitional zone between the water and land. Wasteland and scrub are the most dominant habitats on the bank sides, neither of which will be altered by the controlled water levels.

3.13.8 Invasive Plants

Giant Hogweed occurs amongst some of the emergent planting. It would be desirable to control this species to prevent it from spreading further down the waterway. No aquatic invasive plants are currently on site however they do occur on the existing controlled water system. The waterway should be monitored and subsequent controls put into place in the event that these species spread into the newly controlled water system. Existing aquatic invasives are already being mechanically controlled and the environmental conditions promoting growth being assessed.

3.14 Summary of Findings and Impacts

Potential receptors of impact		Activities and potential impacts Construction phase	Operational phase	Remediation and Enhancements
ECOLOGY				
Birds	Moorhen Mallard Swan Heron	No nesting sites affected. Foraging will be restricted in the area of construction for work duration.	No nesting sites affected.	No remediation required. Enhancements may include reed beds retained for nesting and there is an opportunity to increase emergent vegetation on the Prescott Channel.
	Grey Wagtail	No nesting sites affected. Foraging will be restricted in the area of construction for work duration.	No nesting sites affected.	No remediation required. Enhancements may include creating perching features in the design of an emergent fringe on the Prescott Channel.
	Kingfisher	Human disturbance could prevent the kingfisher from passing sites during sites. No nesting sites affected.	No nesting sites affected.	No remediation required. Enhancements may include above high water level drill 50mm diameter holes into the steel or concrete vertical walls which are backfilled by soil. Above water and no greater than 1m below top of wall.
	Sand Martin	Human disturbance could prevent the sand martins from nesting on Three Mills Wall River for the duration of construction.	No nesting sites affected.	No remediation required. Enhancements may include artificial nesting structures incorporated into the new weirs.

Potential receptors of impact		Activities and potential impacts		
		Construction phase	Operational phase	Remediation and Enhancements
ECOLOGY				
	Linnet White Throat Blackcap Goldfinch Song Thrush Dunnock Long Tailed Tit	Disturbance during breeding season.		Remediation will include: carrying out vegetation removal in winter prior to construction to avoid disturbance of nesting birds; replacing as much scrub as possible on completion of work; incorporating scrub planting into landscape scheme around the Prescott Channel. Enhancements may include improving the quality of terrestrial habitats on the allotments and adjacent to Abbey Creek.
Mammals	Water Vole	None present.	None present.	No remediation required.
	Otter	None present.	None present.	No remediation required.
	Badger	None present.	None present.	No remediation required.
	Bat	No roosting sites affected.	No roosting sites affected.	No remediation required. Possible enhancements may include incorporation of bat boxes into new bridges, alternatively put up some boxes on mature trees close to feeding habitats and the water.
Reptiles	Slow worm Common Lizard Grass Snake	Unconfirmed on the Prescott Channel.		Continued survey and monitoring programme on the Prescott Channel with subsequent action if required
Fish	Freshwater			Remediation includes design of structures to allow passage of relevant

Potential receptors of impact		Activities and potential impacts		
		Construction phase	Operational phase	Remediation and Enhancements
ECOLOGY				
				fish species.
	Migratory	Barrier preventing migration	Barrier preventing migration.	
Crayfish	White Clawed	Not present.	Not present.	No remediation required.
	American Signal	No affect on current movement patterns.	Possibility that controlled water levels will promote signal crayfish movement from the Lee Valley.	If signal crayfish are found during construction then they should be removed and dispatched.
	Chinese Mitten Crab	No affect on current movement patterns.	No affect on current movement patterns.	No remediation required.
Mudflat Invertebrates	Macrofauna	A limited area of artificially created mudflat will be lost on the Three Mills Wall River underneath moored boats, currently hosting few macroinvertebrates in low densities.		No remediation required.
Flora	Aquatic	10m of emergent fringe will be lost on Three Mills Wall River.		Remediation will include encouragement of emergent vegetation with the use of created habitat on the Prescott Channel and along the Three Mills Wall River in case of die back.
	Terrestrial	Permanent and temporary reduction on adjacent land.		Remediation will include replacing as much scrub as possible on completion of work; incorporating scrub planting into landscape scheme around the Prescott Channel. Enhancements will include improving the quality of terrestrial habitats on the

Potential receptors of impact		Activities and potential impacts		
		Construction phase	Operational phase	Remediation and Enhancements
ECOLOGY				
				allotments and adjacent to Abbey Creek.
	Invasive	Japanese Knotweed disturbance on the Prescott Channel.	Aquatic invasive plants are not currently present however it is possible that they may spread into this area.	Remediation will include: taking appropriate measures to ensure Japanese Knotweed is not spread during the construction process and any waste is transferred from site to a registered landfill; continue monitoring the occurrence of aquatic invasives and remove them as they occur in the channels. Possible enhancements may include working with Thames Water and the Environment Agency to improve the water quality.
HERITAGE	Archaeology	Excavation in the river bed in Three Mills Wall River and of the land either side of Prescott Channel: damage to unknown features and lost of archaeological data.		Remediation will include liaison with English Heritage. Checking feasibility of allowing access to archaeologists for a limited period between Compounding and Construction.
			Occasional dredging and maintenance.	No remediation required.
	Built Environment	Construction site with all its associated paraphernalia in a Conservation Area and within the surroundings of listed buildings.		Remediation will include liaison with English Heritage on the design of structures that might impact on Listed Buildings.
LAND	Landscape	Visual intrusion of piling works to create lock structure during initial	Majority of structure below towpath level causing little visual intrusion	Management plan devised and implemented to retain important views

Potential receptors of impact		Activities and potential impacts		
		Construction phase	Operational phase	Remediation and Enhancements
ECOLOGY				
		phases		
		Reduction of wasteland.		Remediation will include soft landscape scheme implemented to replace lost scrub and grassland.
HUMAN ENNVIRONMENT		Open aspect across Mill Meads obscured during works by temporary fencing	Open aspect reinstated and opened up by reduced vegetation	No remediation required.
Boating	Amenity	No boating or visitor facilities currently exist in Olympic Park		No remediation required.
		Residential moorings on Three Mills Wall affected during construction period		Remediation will include temporary relocation of residential moorings if required, and the creation of permanently floating moorings.
Access		Reduced access to Three Mills Wall River path (Prescott Channel side only) for duration of works	Reinstated paths and improved access across structure bringing accessibility and 'policing' to Three Mills and Mill Meads open space	No further remediation required

3.15 Conclusion

The survey information available for the waterways and much of the bird data is from reports of varying ages, incidental sightings and third party disclosure. The physical construction works will have local effect. The most apparent is the removal of 350 linear metres of scrub and waste land vegetation along the banks on the Prescott Channel and 20 metres on the Three Mills Wall River. However, providing the vegetation removal is carried out in winter it will not have any direct effect on nesting birds and there is extensive local habitat which the birds can exploit in the absence of this narrow strip of vegetation. Construction work disturbance will be limited as the site will have well defined boundaries. On completion 40 metres will be reinstated with further compensation gained in the landscaping and habitat improvement on the allotment site. Artificial nesting features and boxes will also be incorporated into the construction. This area may also support reptiles although none were recorded in the 2006 summer survey and ongoing survey work to determine presence will guide future action at the site.

There will be a loss of man-made consolidated mudflat underneath Three Mills Moorings and mobile exposed sediments on the Three Mills Wall River, however, these areas have been shown to be of low value, supporting few macrofauna species in fairly low densities. This area is also impacted upon from existing residential moorings which sit on the mud at low tide.

In comparison, the mudflats to the south of the new weir on Three Mills Wall River are rich in macrofauna species and this area remains unaffected by the new control structure.

Although generally some inter-tidal habitat will be lost British Waterways will, as part of the joint Defra agency recommendation, be working in partnership with a number of interested parties to improve the condition of the larger and richer tidal waters of Bow and Abbey Creek, to maintain a fully functional ecological corridor. The inter-tidal water north of the control structure will be replaced by a freshwater system which, providing good water quality is maintained, will be able to support good invertebrate assemblages.

The waterways are not very diverse and offer little in channel habitat, other than the limited amount of low-value mobile exposed sediment discussed above. It is unlikely that the emergent plant fringes will be lost with a controlled water level as they are already situated on banks. If flooding does cause adverse effects to the emergent growth then further work to promote these areas would be required. Any effects on vegetation will be restricted to the water and that means all the land adjacent to the rivers will remain unchanged. Aquatic invasive plant occurrence will be monitored and subsequent control measures put into place as well as continued management of the existing problem on other waterways.

Fish migration into the tidal Channelsea River and down into Bow Creek would be via the structures and there would be an overall positive benefit for the coarse fish species brought about by the additional freshwater habitat created by the structure. The fish population from Stratford Marshes upstream appears to be dominated by coarse fish species freshwater species ‘except for a solitary flounder’ and eels (Tyner survey report, 1991).

The water control structures will be required to allow passage of migrating eels, and migratory species of the lamprey family, that are known to be present in the Thames.

There will be short-term visual intrusion during construction of the works and care should be taken to limit this. The visual intrusion on the land adjacent to the canals is not detrimental.

The character of the Conservation Area will be preserved and is likely to be enhanced. The proposed works will not directly affect any of the listed buildings but for the knock-on, positive contribution to the House Mill. The setting of the listed buildings will not be affected.

An Environmental Management System is used by British Waterways to assess and control the environmental effects of any works. An Environmental Management Statement will be prepared and regularly updated for this project to ensure that all of the environmental aspects are taken into account when designing and implementing the works.

It is also recommended that management plans are developed which will promote the opportunities identified in this report for future ecological diversity.

4.0 Planning

4.1 Factual Background

The Prescott Channel appears to have been constructed pursuant to the River Lee (Flood Relief etc) Act 1930 ("the 1930 Act"). The 1930 Act was a Private Act of Parliament authorising what was then the Lee Conservancy Board ("the Board") to execute certain works

> *"… for the improvement of the river Lee and other rivers in and adjoining that borough".*

Section 4 of the 1930 Act specified the authorised works. We are instructed that the works needed to create the Prescott Channel were listed as "Work No. 18" in section 4, namely:

> *"A flood channel with weir and sluices commencing on the eastern side of the Three Mills Wall River as widened under the powers of this Act at a point 4.0 chains or thereabouts northward of the Monument north of Three Mills and terminating by a junction with the Channelsea River at a point 8.1 chains of thereabouts eastward of the junction of the Channelsea River with Bow Creek".*

Section 19 of the 1930 Act provides that the diverted or altered rivers (including the Prescott Channel) shall be under the jurisdiction and control of the Board. Section 20 vests the various works, structures and the sites thereof in the Board, and makes it the responsibility of the Board to maintain them at its own expense. British Waterways is the statutory successor of the Board's navigation functions.

The Prescott Channel originally had a vertical gate situated at its lower end, which was in place up until the late 1960s. Its function was to enable water to be impounded to facilitate navigation. This structure was removed by British Waterways in the mid-1980s.

The Prescott Channel is classified as a remainder waterway pursuant to section 104(1)(c) and Schedule 12 of the Transport Act 1968. It is also identified as a Protected Site of Nature Conservation Importance in the London Borough of Newham's Unitary Development Plan (2001).

4.2 The Proposed Works

The proposed works are described in detail at section 2

The working area associated with the proposed structure would be marginally less than one hectare, and that the structure would control approximately 260,000 cubic metres of water at a fixed level.

4.3 The Issues

(i) Whether or not the proposed works would have the benefit of permitted development rights as contained in the Town and Country Planning (General Permitted Development) Order 1995 ("the GPDO").

(ii) Whether or not the proposed works require environmental impact assessment pursuant to:

(a) the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999[1] ("the EIA Regulations");

(b) the Water Resources (Environmental Impact Assessment) Regulations 2003[2] ("the WR (EIA) Regulations"); or

(c) the Environmental Impact Assessment (Land Drainage Improvement Works) Regulations 1999[3] ("the EIA (LDIW) Regulations").

(iii) If the proposed works have the benefit of permitted development rights, whether Class B or C (or both) of Part 17 of Schedule 2 to the GPDO would apply.

4.3.1 Permitted Development

In order for the proposed works to benefit from the provisions of the GPDO, they must fall within one of the classes of development described as permitted development in Schedule 2 to that Order. In addition, the works must not constitute EIA Development, as defined in the EIA Regulations.

There are three potentially relevant provisions within Schedule 2 to consider, namely parts 14, 17 Class B and 17 Class C.

Part 14

Part 14 of Schedule 2 concerns development by drainage bodies. The permitted development is defined as:

"Development by a drainage body in, on or under any watercourse or land drainage works and required in connection with the improvement, maintenance or repair of that watercourse of those works."

For the purposes of this provision, "drainage body" is defined so as to mean the Environment Agency, an internal drainage board or

"… any other body having power to make or maintain works for the drainage of land"[4].

The 1930 Act would appear to have given British Waterways' predecessor the power to make and thereafter maintain the Prescott Channel for the purpose, amongst

[1] (S.I. 1999 No. 293)
[2] (S.I. 2003 No. 164)
[3] (S.I. 1999 No. 1783)
[4] Land Drainage Act 1991, s. 72(1)

other things, of the drainage of land. The recitals to the 1930 Act included the following:

> *"And whereas the said rivers form the principal drainage outlet for the surface water coming from an extensive area in the counties of London Essex Hertford and Middlesex:*
>
> *And whereas certain of the said rivers are narrow and tortuous and flooding is consequently caused not only in the borough but also in the upper reaches of the river Lee:*
>
> *And whereas it is expedient that for the purpose of preventing or minimising the risk of flooding and of rendering navigable at all states of the tide certain parts of the said rivers and of improving the navigation of the said rivers the Board … should be empowered to execute the works by this Act authorised*:"

Regulation 2(1) of the EIA (LDIW) Regulations defines "improvement works" as works which are:

> *"(a) the subject of a project to deepen, widen, straighten or otherwise improve any existing watercourse[5] or remove or alter mill dams, weirs or other obstructions to watercourses, or raise, widen or otherwise improve any existing drainage work; and*
>
> *(b) permitted development by virtue of Part 14 or 15 of Schedule 2 to [the GPDO]".*

Part 17, Class B

The permitted development authorised by Part 17, Class B is defined as

> *"Development on operational land by statutory undertakers or their lessees in respect of dock, pier, harbour, water transport, or canal or inland navigation undertakings, required –*
>
> *(a) …*
> *(b) in connection with … the movement of traffic by canal or inland navigation …".*

There are thus four requirements to be satisfied in order for the proposed works to be permitted development under Part 17 Class C. We will address each requirement in turn.

(a) Development on Operational Land

[5] "Watercourse" is defined very broadly by Regulation 2(1) of the EIA (LDIW) Regulations so as to include any river, or drain, cut or passage through which water flows.

"Operational land" is not defined in the GPDO, and therefore it is necessary to refer to the definition given in the parent Act, the Town and Country Planning Act 1990 ("the 1990 Act"). Section 263(1) of the 1990 Act defines "operational land" as follows:

> *"Subject to the following provisions of this section and to section 264, in this Act "operational land" means, in relation to statutory undertakers –*
>
> *(a) land which is used for the purpose of carrying out their undertaking; and*
> *(b) land in which an interest is held for that purpose."*

That definition is qualified by subsection (2), which provides as follows:

> *"Paragraphs (a) and (b) of subsection (1) do not include land which, in respect of its nature and situation, is comparable rather with land in general than with land which is used, or in which interests are held, for the purpose of the carrying on of statutory undertakings."*

Whether or not any land falls within those descriptions is a question of fact in each case[6].

The land on which the works are proposed is "operational land" as defined, being land used for the purpose of carrying out British Waterways' undertaking. In our opinion, the nature and situation of the land is such that it could not be said to be comparable rather with land in general rather than land held for the purpose of the carrying on of statutory undertakings.

(b) By statutory undertakers

Article 1(2) of the GPDO defines "statutory undertaker" so as to include any person mentioned in section 262(1) of the 1990 Act. The definition of "statutory undertaker" in section 262(1) of the 1990 Act includes:

> *"… persons authorised by any enactment to carry on any … water transport, canal, inland navigation … undertaking …".*

British Waterways is therefore a statutory undertaker for these purposes.

(c) In respect of water transport, canal or inland navigation undertakings

There would appear to be no doubt that this requirement is satisfied.

(d) Required in connection with the movement of traffic by canal or inland navigation

[6] R v. Minister of Fuel and Power, ex parte Warwickshire County Council [1957] 1 W.L.R. 861

Again, there would appear to be no doubt that this requirement is satisfied. The proposed works are for the purposes of making the Bow Back Rivers more accessible to traffic.

On that basis, we consider that the proposed works would fall within the definition of permitted development under Class B of Part 17.

Part 17, Class C

Part 17 Class C deals with works to inland waterways. Permitted development under Class C is defined as:

"the improvement, maintenance or repair of an inland waterway (other than a commercial waterway or cruising waterway) to which section 104 of the Transport Act 1968 (classification of the Board's waterways) applies, and the repair or maintenance of a culvert, weir, lock, aqueduct, sluice, reservoir, let-off valve or other work used in connection with the control and operation of such a waterway."

Section 159 of the Transport Act 1968 defines "inland waterway" as including every such waterway, whether natural or artificial. We are instructed that the Prescott Channel is an inland waterway to which section 104 of the 1968 Act applies, and that it is neither a commercial waterway nor a cruising waterway. Improvement, maintenance or repair of the Prescott Channel is therefore permitted development under Class C.

4.3.2 Environmental Impact Assessment

(a) The EIA Regulations

Environmental Impact Assessment will be required if the proposed works are properly classified as "EIA Development" as defined in Regulation 2(1) of the EIA Regulations, namely:

"… development which is either –

(a) Schedule 1 development; or
(b) Schedule 2 development likely to have significant effects on the environment by virtue of factors such as its nature, size or location."

If the proposed works are EIA development, they will not be permitted development under the GPDO[7].

Schedule 1

[7] Article 3(10) and (11) of the GPDO

The most relevant description of development contained in Schedule 1 would appear to be paragraphs 8(a) and 15, which cover:

> *"The carrying out of development to provide …*
>
> *8. (a) Inland waterways … which permit the passage of vessels of over 1,350 tonnes.*
>
> *15. Dams and other installations designed for the holding back or permanent storage of water, where a new or additional amount of water held back or stored exceeds 10 million cubic metres."*

Paragraph 8(a)

Vessels using the Prescott Channel or indeed other parts of the Bow Back Rivers would be significantly under that weight. It may well be the case that the Prescott Channel would not in practice be used by vessels of that size, but the question raised by paragraph 8(a) is rather different, i.e. whether the characteristics of the waterway would be such that it would permit their passage. If the Prescott Channel would be able to permit the passage of such vessels following the proposed works, those works would fall within the description of development given in paragraph 8(a). They would therefore be Schedule 1 development, and require EIA. It is clear from the dimensions of the waterway that vessels of over 1,350 tonnes cannot pass the waterway.

Paragraph 15

The amount of water impounded by the proposed works would amount to only 260,000 cubic metres, and therefore the proposed works would not meet the description of development in paragraph 15.

Schedule 2

Schedule 2 development is defined in Regulation 2(1) of the EIA Regulations as meaning:

> *"… development, other than exempt development, of a description mentioned in Column 1 of the table in Schedule 2 where –*
>
> *(a) any part of that development is to be carried out in a sensitive area; or*
> *(b) any applicable threshold or criterion in the corresponding part of Column 2 of that table is respectively exceeded or met in relation to that development".*

It does not appear that any part of the proposed development would be carried out in a "sensitive area" as defined in Regulation 2(1).

The most relevant descriptions of development in Schedule 2 are those contained in paragraph 10(h) and (i), namely:

> *"(h) Inland-waterway construction not included in Schedule 1, canalisation and flood relief works.*
> *(i) Dams and other installations designed to hold water or store it on a long-term basis (unless included in Schedule 1)."*

In both cases, the Column 2 threshold is that the "area of the works exceeds 1 hectare". In Schedule 2, "area of the works" is defined so as to include:

> *"… any area occupied by apparatus, equipment, machinery, materials, plant, spoil heaps or other facilities or stores required for construction or installation."*

The working area associated with the proposed structure will be marginally less than one hectare and as such would not be exceeded the threshold contained within Schedule 2 development.

It is to be noted that whereas in Schedule 1 paragraph 15 the measure of significance of an installation designed to hold back or store water is the amount of water held back or stored (measured in cubic metres), the same is not true in Schedule 2 paragraph 10(i). In the latter case, the measure of significance is the area of the works. In our view this would not include an assessment of the amount of water held back or stored, because the area is to be measured using hectares. There does not appear to be any obvious rationale for the difference in approach.

We have had regard to the guidance contained in Circular 2/99: Environmental Impact Assessment, and, in particular, the indicative thresholds and criteria for identification of Schedule 2 developments requiring EIA provided in Annex A to the Circular. In respect of "dams and other installations designed to hold water or store it on a long-term basis", the guidance states:

> *"In considering such developments, particular regard should be had to the potential wider impacts to the hydrology and ecology, as well as to the physical scale of the development. EIA is likely to be required for any major new dam (e.g. where the construction site exceeds 20 hectares)".*

The proposed works, and their likely impacts, would evidently not be of the scale of a major new dam, but there is evidence to suggest that there are potential wider impacts on hydrology and ecology[8].

(b) The WR (EIA) Regulations

The proposed works would not be covered by the WR (EIA) Regulations.

Regulation 3(1) makes clear that an environmental impact assessment is required only in relation to a "relevant project" as defined in Regulation 3(2). The proposed works are not a "water management project for agriculture" as described in Regulation 3(2), and are therefore not a "relevant project".

(c) The EIA (LDIW) Regulations

[8] Enclosure 5, paragraphs 2.6, 2.7, 2.9, 2.10, 3.1, 3.5, Figure 5.1, section 7 and in particular Appendix A.

The requirements of the EIA (LDIW) Regulations apply to "improvement works" carried out by a "drainage body".

The term "drainage body" is defined in Regulation 2(1) as meaning:

> *"… any of the following public authorities which initiates improvement works, namely:*
>
> *(a) the Environment Agency;*
> *(b) an internal drainage board; and*
> *(c) the council of a county, a county borough, a district or a London borough, the Common Council of the City of London or the Council of the Isles of Scilly".*

British Waterways is therefore not a drainage body for the purposes of the EIA (LDIW) Regulations, and consequently the proposed works would not be covered by those Regulations.

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4.4 Conclusion

For the reasons we have given above, we consider that the proposed works would fall within the description of permitted development contained in Part 17 Class B,

We also conclude that the preparation of a Project Explanatory Statement should be carried out.

The main benefit that we discern is the ability for British Waterways properly to understand the environmental consequences of the proposed works before a decision is made to proceed with those works. As our instructions acknowledge, that is important in the context of section 22(1) of the British Waterways Act 1995, which provides that

> *"It shall be the duty of the Board, in formulating or considering any proposals relating to their functions –*
>
> *(a) so far as may be consistent with the purposes of any enactment relating to those functions, so to exercise any power conferred on them with respect to the proposals as to further the conservation and enhancement of natural beauty and the conservation of flora, fauna and geological or physiographical features of special interest.*
> *(b) …*
> *(c) to take into account any effect which the proposals would have on the beauty or amenity of any rural or urban area or on any such flora, fauna, features, buildings, sites or objects."*

In order to ensure that the process of assessment has been effective, British Waterways has been working with the Defra agencies (English Nature and the Environment Agency) and local authorities to adequately consider the effect of undertaking the works.

5.0 Flood Risk Assessment

5.1 Flood Management Issues

Within the Bow Back Rivers area there are a number of flood risk issues. Improvements provided by the Defra proposals that would reduce flood risk in this area would have obvious benefits.

Around Bow Locks recent work has improved flood defences to a level of 4.8m AOD. Some flood storage has been provided by the exclusion of tidal waters from the River Lee Navigation and this is compatible with the overall strategy for the Lower Lea. Further tidal exclusion using Waterworks River could enhance the flood defences upstream of Three Mills to Stratford.

5.2 Lower Lea Valley and Flood Management

The Lower Lea Valley has a history of both fluvial and tidal flooding events. The natural hydrographic regime and artificial intervention to better suit industry and the wider community have been principal elements in shaping the watercourse system as it exists today.

The current fluvial and tidal conditions are considered below to provide a context to the Prescott Channel Structure proposal.

5.2.1 Fluvial Flooding

Prior to the 1930 flood relief works in the Lower Lea, flooding of low-lying riverside areas was not unusual.

Following flood relief works undertaken around seventy years ago, the main flow route for the River Lea in a high flow condition became the Waterworks River and the Prescott (flood relief) Channel. For a 1 in 100 year flood event peak flow is in the order of 180 cumecs. Around 170 cumecs enters Bow Creek via Prescott Channel and 10 cumecs passes via the House Mill.

Fluvial data has been collected from Lea Bridge Sluices; the sluices are connected to British Waterways' SCADA system and historical records are available. The Environment Agency similarly holds data that supports the above peak flows. Halcrow Engineering Group was able to use Environment Agency data in their modelling of the Lower Lea and the proposed Prescott Channel Structure.

5.2.2 Fluvial Storage

There is additional storage capacity available in the Bow Back Rivers that can be used to reduce the peak outflow through the Prescott Channel. At a water level determined by the Environment Agency and agreed with British Waterways (4.8m AOD), Carpenters Road Lock can be opened to utilise the available flood storage within the Bow Back Loop (City Mill River, Old River Lea, River Lee Navigation and the Bow Back River) and the Limehouse Cut. This storage volume is available for the attenuation of peak fluvial flows.

The provision of this additional flood storage was realised by works undertaken by British Waterways to Bow Locks. The Bow Back Loop and Limehouse Cut were formerly semi-tidal, retaining a minimum water level for navigation at low tide but being inundated at high tide. Works to Bow Locks and the adjacent flood walls shut out all tides. The Bow Back Rivers and Limehouse Cut have a fixed water level of approximately 3.0 m AOD. This means that capacity is available for the storage of peak flows which is compatible with the overall Lower Lea Flood Management Strategy.

5.2.3 Tidal Element and the Thames Barrier

Bow Creek and the waterway upstream has historically been the subject of tidal flooding. The waterway walls of Bow Creek, the Prescott Channel and beyond form part of London's flood defences and work in conjunction with operation of the Thames Flood Barrier.

At present, the Thames Barrier closes to shut out tides of around 4.8 m AOD and above. A detailed operating strategy is available from the Environment Agency which is responsible for operation of the barrier. The flood walls around Bow Creek are generally at or above 5.0m AOD and, therefore, the combination of barrier operation and flood walls protect the Lower Lea from tidal flooding.

The Thames Barrier is also used to create fluvial storage within the Thames Basin. In advance of forecast high flows that would coincide with peak tide levels, the barrier is closed to shut out the incoming tide and, therefore, create additional fluvial storage capacity within the Thames Basin.

5.3 Developing Flood Risk Assessment for the Defra Proposal

Initial modelling and Flood Risk Assessment work was completed in May 2006. The objective of this initial assessment was to demonstrate the feasibility of the proposed structures and show that they could be constructed with no detrimental impact to the Lower Lea Valley FRA.

In modelling the proposed structures, the following assumptions were made:

- The principal objective of the proposal is to facilitate navigation upstream of Prescott Channel. This would provide the potential for freight use during the development of the Olympic Park infrastructure, and future leisure use, post-Olympics.
- In order to achieve this it will be necessary to construct a water control structure on the Prescott Channel. The intention would be for this to be located close to the site of a previous tidal exclusion structure, which lies on British Waterways' land. It will also be necessary to provide a second water level/tidal exclusion structure on the Three Mills Wall River, upstream of Three Mills.
- The flood risk impacts have been tested by representing these structures within the Tuflow hydraulic model, and then comparing the results (predictions of flood levels) with the predicted flood levels from the baseline flood model. This is a comparative exercise and should not be seen as providing the final definitive production of flood levels. This will need further, more in-depth analysis at a future date.

- For the Prescott Channel Control Structure, 6 structure options have been tested – A to F. The form of these structures has been provided by British Waterways and the development of the options has been informed by successive modelling results.
- Option E appears to provide the basis for a solution which would meet the objectives

Note that following this initial modelling and investigation, further revisions have been made to the arrangement of the structure. A second stage of investigation has commenced that will test these revisions.

5.3.1 Hydraulic Modelling Approach

Modelling has been carried out on an iterative basis utilising the Tuflow model provided by the LDA for this purpose. In all cases, each model result has been compared to the baseline model. The baseline model has been accepted by all parties as offering the best available representation of the way the Lower Lea system responds in flood events in its current condition.

The baseline model has been used in this comparative way to assess impacts of the proposals. This applies to both the PCCS and Hackney Marshes Flood Plain. The baseline model has been used as this is consistent with the current model used in the development of the Lower Lea Strategic Flood Risk Assessment.

5.3.2 Prescott Channel Control Structure (PCCS)

The PCCS has gone through a number of iterations during the progression of these analyses.

The structure has two main functions. Firstly, it would control the upstream water level. British Waterways has indicated that this will be within a range of circa +2.3m AOD. This level has been determined as the most appropriate for upstream navigation. Secondly, it will prevent tidal encroachment upstream beyond the structure.

Buro Happold has modelled the progressive conceptual development of the PCCS using information on the form of the structure provided by British Waterways.

During this process, and in response to adverse flood risk impacts, the control structure concept has been modified and then re-tested in the hydraulic model. Such modifications have been made through discussions with and direction from British Waterways.

The options development is recorded in the table below (Figure 1). However, and as is normal with hydraulic modelling, a number of sub-options have also been considered. The important sub-option recorded in this report is the way the invert level (bed level) of the PCCS has been modelled.

The original Option A had an invert level of -1.0m OD and this was used for the initial model run. Subsequently, the Option B proposals showed the invert level as – 0.8m OD and so this was represented in the model for that option. However, in comparing this with the existing model configuration, it was found that the existing

bed level at the proposed structure location is -0.1m OD. This represents a difference in bed level of almost 1m. It was, therefore, agreed with British Waterways that for all model runs from Option B onwards, two bed levels would be tested in the model – a bed level of -0.8m OD and a bed level of +0.1m OD.

Discussion was held within the Workstream Group as to whether the lock channel could and should be used as part of the flood carrying capacity of the PCCS. This was also raised within the Waterways Steering Group meeting on 5th May, with British Waterways making a strong case for this approach. The EA were asked to give a clear direction on this matter and they have subsequently confirmed that they would not accept a proposal that relied on the operation of the lock structure for flood capacity.

At this stage of development, and within the time constraints, two hydrological conditions have been tested for each option. These represent the 1 in 100 fluvial flood event combined with the 1 in 20 year tidal event, and this combination has been run for present day conditions and with climate change allowance. Both options have been tested, to see which is most critical, although it is expected that the climate change condition would be likely to represent the most critical condition which has to be met.

Also, due to time constraints, the PCCS (and the TMCS) has been run assuming the sluices in a fully open condition. It is recognised that the structure will need to operate through a controlled sequence of opening and closing, dependent on fluvial and tidal conditions, but it is too early in the development of the proposals to be able to define and, therefore, model this.

Clarification and guidance was sought from the EA as to what would be considered to be an acceptable result compared to the baseline model predictions. The EA has responded that there should be no increase in flood risk as a result of the proposals, echoing the Defra statement of 28th March 2006. From experience gained from an earlier modelling exercise relating to the Aquatic Centre site, the Tuflow model was found to predict adverse hydraulic impacts resulting from increases in water levels of as little as 3mm. Therefore, for the purpose of this exercise, we have taken the position that changes in predicted flood levels of more than 2mm represent an adverse flood risk.

Figure 1

Option	Description	Additional Information
A	Conceptual sketch (Sketch A) received from BW on 24th April. This shows a plan and section of a structure incorporating an 8.3m wide lock structure on the west side and an 18m wide flood channel on the east side within a circa 90m lo Fig. 1 in Appendix A.	This sketch was provided by BW to assist BH in commencing the modelling in advance of a more detailed concept drawing from BW's consultants, Atkins. The structure had no details of water level control mechanisms, number of flood sluices or entry and exit conditions. The lock is separated from the flood channel by a 4m wide 'island'. The flood channel invert level is indicated as -1.0m OD. BW's site ownership boundary was also

		indicated on the sketch.
B	Engineering concept drawing received from BW's Engineering Consultants, Atkins, on 3rd May. Option includes 8.3m wide lock structure and a flood channel containing 3 No. 6m wide sluices. Form of sluices not specified but structure configured to accommodate bottom hinged flat gates The structure is shown as 155m long – see Figure 2 in Appendix A.	The length of the structure was driven by the objective of accommodating 3 No. barges within the lock which was shown with 3 No. pairs of vertical sector gates. The lock is separated from the flood channel by a 5m wide 'island' – a 1m increase but projections from the island wall into the flood channel were shown at the sector gate positions to accommodate the sector gate mechanisms. BW's site ownership boundary was also indicated on the drawings. The invert level of the flood channel was shown as -0.87m OD. 2 No. piers were shown within flood channel, 2m and 1m wide respectively. An upstream 100m long training wall was added to the structure by BH to represent a hydraulically smooth transition from the channel to the structure.
C	Based on Option B but with the 3 No. flood channel sluices widened by 1m each additional 3m of channel width. This has been achieved within the same overall structure width as Option B.	The lock structure has been reduced in width to 7.7m. The 'island' has been reduced to its original width of 4m. Flood channel piers are both 1m wide (instead of a 2m and a 1m wide pier) which would dictate that only vertical lift sluice gates could be accommodated within the structure. Structure reduced in length to 100m long.
D	This option is identical to Option C but it represents a condition which now includes representation of a control structure on Three Mills Wall River for modelling purposes.	
E	This option is based on Options C and D above but has an additional 6m wide flood channel sluice (making 4 in total). This has been achieved by widening the overall structure within BW's site ownership boundary	BW has achieved this configuration by transferring the lock to the east side and the flood channel to the west side, keeping the structure's overall length as circa 100m.
F	Option F is identical to Option D but has been modified with the lock	This option has been run purely to assess the potential effects of allowing flood flow to pass the temporary lock. However, the

	structure open to allow flood flow.	EA has stated that they would not accept a solution which relied on the lock channel to provide this function. It might be useful to retain this facility in the event of a failure of one of the sluice gates or if one is taken out of commission for maintenance or repair purposes.

5.3.3 Three Mills Control Structure

At the present time a rising tide can penetrate Three Mills through the existing sluices beneath the Mill and encroach through Three Mills Wall River, and so upstream. The rate of flow is limited to some extent by the restriction of the sluice openings beneath the Mill. Obviously, the rising tide also passes via the Prescott Channel into the Three Mills Wall River and beyond and this channel will have greater capacity than Three Mills to transmit flow upstream.

The converse of the above is true on a falling tide.

As indicated above, in addition to the PCCS it will be necessary to impose some form of control on the Three Mills Wall River to ensure that water level control and tidal exclusion are achieved. This cannot be achieved by operating the sluices at Three Mills as this would prevent tidal power generation – a stated objective of the Defra proposals. Also, there is uncertainty over the responsibility and ownership of the sluices themselves.

The arrangement modelled at Three Mills Wall River is currently three 8m wide gates; this arrangement provides required flow capacity. Further modelling will be undertaken to test this arrangement; it appears likely that two 8m gates would be sufficient to fulfil flood risk objectives.

5.3.4 Results

The results of the analysis carried out to date are tabulated to show, for each option, and for a selection of model nodes (locations) both upstream and downstream of the proposed structure:

1. The predicted flood level
2. The difference between this and the baseline predicted flood level

Note that Option A results have not been included as these have no useful purpose.

A plan is also included to show the location of each of these model nodes to aid interpretation.

Where an option has a corresponding sub-option (Option B and B1, for example), the main option represents the net result obtained using the lower bed level and the sub-option represents the results obtained using the higher bed level

It is not the intention to provide an in-depth technical analysis of the results here. Rather the results for two locations for comparative purposes. These locations

are Model Node 10 (upstream of and close to the proposed PCCS) and Model Node 25 (immediately upstream of the A12). The results, given in Table 2 below show if the structure option increases or decreases the predicted flood level compared to the baseline.

Table 2

Option Number	Node 10	Node 25
B	+31mm	+13mm
B1	+51mm	+26mm
C	+17mm	+7mm
C1	+35mm	+10mm
D	+12mm	-18mm
E	-8mm	-4mm
E1	+5mm	-2mm
F	-34mm	-16mm
F1	-30mm	-30mm

It should be noted that Options A to C were not tested with the inclusion of the Three Mills Control Structure. This was because the concept of the structure had not been developed fully at that stage. Instead, as a proxy to the effect of this structure Options B and C were tested with Three Mills (the existing mill structure) both open and closed (although the results above and in Appendix C are for Three Mills in the open position. It was recognised that keeping it open would underestimate the hydraulic effect, under-predict the increase in flood level upstream and keeping it closed would over-estimate this hydraulic effect (over-predict the increase in flood level upstream) but it was known that the likely effect would fall between the two sets of results.

5.3.5 Conclusions

The results show that final iterations of the structural arrangements meet Flood Risk Assessment requirements; no increase in flood level is recorded upstream of the new structures.

6. Summary

The proposed DEFRA scheme and specifically the planned Prescott Channel and Three Mills Wall River works being led by British Waterways will make an enormous difference to the way in which the Bow Back Rivers and waterways of the Lower Lea Valley are used and enjoyed in the future.

Restoration and regeneration of the Lower Lea waterways has been a long term aspiration and the 2012 Olympic Games have provided a catalyst for implementation.

Waterworks River and the Prescott Channel will become usable navigations, bringing the exciting prospect of seeing water borne traffic servicing the Olympic

Park during its construction. Consequently, roads will be less congested around what will be a major hub of European construction activity.

The water spaces created will have a far higher amenity value, being both accessible and safely usable for leisure and recreation activities.

The environment will change. Fundamentally, the existing tidal reaches of Waterworks River will become fluvial systems. Coupled with bank improvement works associated with the Olympic Park, the currently poor and degraded channels will become strong environmental links between the northern areas of the Lea Valley Park and the Thames Basin. A programme of environmental improvements associated with this project will strengthen the green corridor further.

The structures that facilitate these changes will be carefully engineered and tested extensively throughout the detailed development stage of the works. It has been shown that control structures can be built that will meet Flood Risk Assessment criteria. The structures cannot increase the likelihood or magnitude of future flood events and this vital condition has been met.

The Explanatory Statement has summarised Planning issues and demonstrated that the proposed works can be undertaken within the context of British Waterways' development powers.

Work is on-going to resolve outstanding issues relating to the implementation of this scheme. However, a plan and programme is in place for achieving this and all partners look forward to the construction stage and sharing in the significant improvements that the scheme will bring to the Lower Lea Valley.